

A NEW SPECIES OF THE AQUATIC BEETLE  
GENUS *DRYOPOMORPHUS* FROM BORNEO  
(COLEOPTERA: ELMIDAE: LARINAE)

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*Abstract.*—A new species of an asiatic elmid genus, *Dryopomorphus satoi*, from Sabah, Borneo, is described, illustrated with line drawings and scanning electron micrographs, and distinguished in a key from the other three described species.

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The genus *Dryopomorphus* was described by Hinton (1936) with *D. extraneus* from Japan as the only included species. Since that time, one additional species, *D. nakanei* Nomura (1958), was described from Japan, and a third species, *D. bishopi* Hinton (1971), was described from Malaysia. The new species described below is the second known species of *Dryopomorphus* from Malaysia.

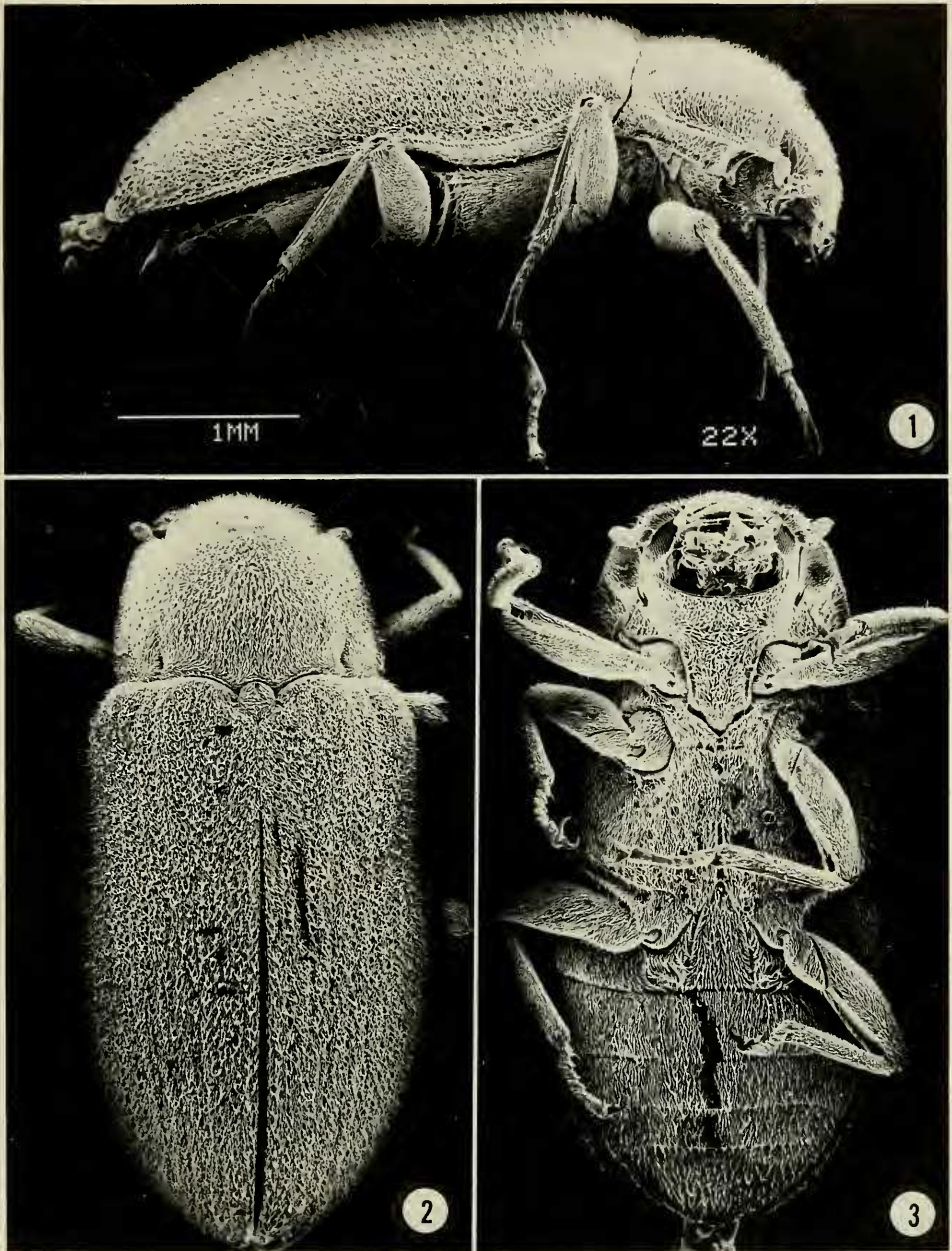
*Dryopomorphus satoi*, new species  
Figs. 1-9

*Holotype male.*—Body form and size. Oblong; moderately convex dorsally. Length, 4.0 mm; width, 1.7 mm (Figs. 1-3).

*Color.*—Black dorsally except antennae yellowish-brown basally and slightly darker brown apically. Dorsum covered with long, sparse, black setae and short, dense, light yellowish-brown hydrofuge setae. Venter dark reddish-brown except genae, sides of prosternum, anterior half of hypomeron, all palpi, labium, coxae, trochanters, and tarsi lighter reddish brown.

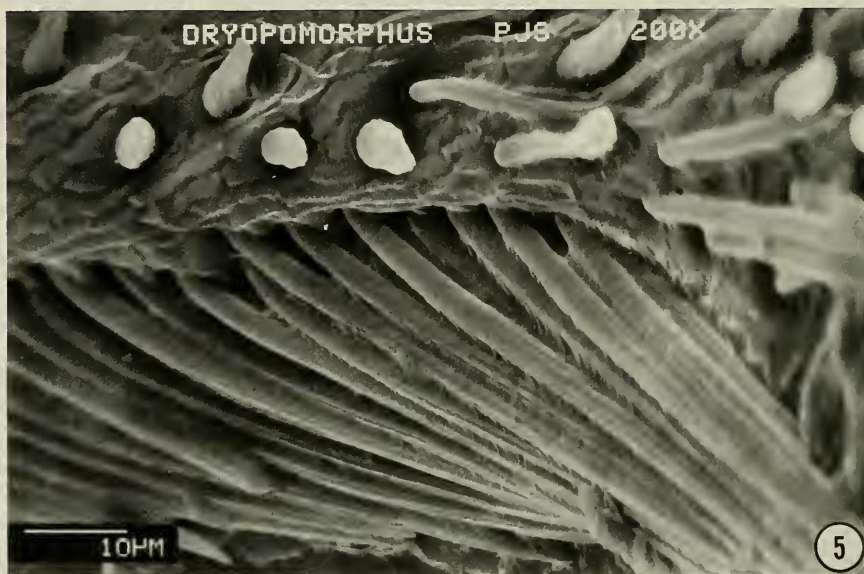
*Head.*—Surface with dual punctation; coarse punctures sparse, widely separated; fine punctures dense, separated by distance equal to their diameters. Patch of dense pubescence posteromedial of each eye. Eyes moderately strongly convex. Clypeus with anterior margin nearly truncate; surface punctate similarly to head; without conspicuous transverse row of long setae bent over labrum. Labrum with anterior margin bordered with dense golden setae; lateral angles with moderately dense tuft of long golden setae curved toward midline; surface punctate similarly to head. Labium with prementum bearing 2 transverse tufts of long, stout, black, bristle-like setae; submentum with numerous, long, yellowish setae on middle.

*Thorax.*—Pronotum 0.8 mm long, 0.9 mm wide; widest across base; sides moderately arcuate; disc without median longitudinal impression, evenly convex; surface of disc punctate similarly to head; sublateral basal sulcus deep, straight, and subequal to length of scutellum; sides not steeply sloping; anterolateral angles obtuse, rounded; posterolateral angles obtuse, not rounded; lateral margins each distinctly rimmed. Hypomeron with anterior cavity for reception of antenna moderately deep and separated from posterior portion by distinct, transverse ridge; surface behind cavity coarsely, moderately densely punctate. Prosternum in front of coxae about one and one-half times longer than length of procoxae. Prosternal process broad, margined laterally, and tapering broadly to protuberant apex. Mesosternum deeply foveate for reception of protuberance of prosternal process.



Figs. 1-3. *Dryopomorphus satoi*, new species, habitus: 1, Lateral view; 2, Dorsal view; 3, Ventral view.

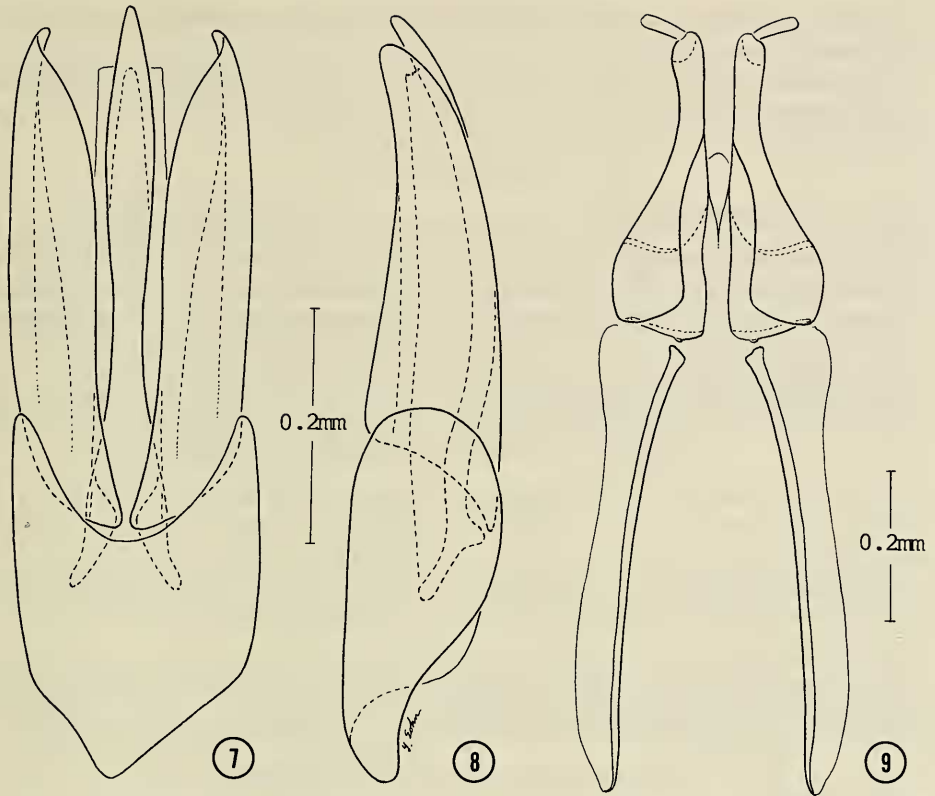
Metasternum with shallow median longitudinal impression; sides with punctures about 4 times as coarse as facets of eyes and separated by 1 to 3 times their diameters; disc densely, moderately coarsely punctate and with 4 or 5 very coarse punctures laterally adjacent to declivous sides. Foreleg uniformly pubescent. Middle and hind legs pubescent except posteromedial surfaces of tibiae glabrous;



Figs. 4–6. *Dryopomorphus satoi*, new species: 4, Mesotibial fringe, 200 $\times$ ; 5, Mesotibial fringe, 1200 $\times$ ; 6, Metatibial fringe, 200 $\times$ .

mesotibia with rather slender cleaning fringe of longer setae on inner, apical three-fourths (Fig. 6); metatibia with moderately dense cleaning fringe on inner apical three-fourths (Figs. 4, 5). Scutellum flat, ovate; base and apex about equally rounded; surface finely, densely punctate. Elytron with 10 rows of coarse punctures; surface finely densely punctate; with fine erect setae as long as intervals are wide; with fine, much denser, shorter, suberect setae between erect setae; base adjacent to scutellum with short, indistinct, transverse plica in distinct impression.

*Abdomen.* — First sternum with sublateral carinae prominent and complete; sur-



Figs. 7-9. *Dryopomorphus satoi*, new species, genitalia: 7, Male, dorsal view; 8, Male, lateral view; 9, Female, dorsal view.

face between carinae densely, moderately coarsely punctate; with large, deep, ovoid cavity laterally on each side of each carina; cavities surrounded with long setae that extend across openings. Surface with coarse, sparse punctures and fine, dense punctures.

*Male genitalia.*—As illustrated (Figs. 7, 8).

*Female.*—Similar to male externally. Genitalia as illustrated (Fig. 9).

*Type data.*—Holotype male: BORNEO: SABAH: Poring, 18 Sep 1983, Warren E. Steiner, Jr., and Gary F. Hevel; USNM Type-No. 100122; deposited in the National Museum of Natural History, Smithsonian Institution. Allotype and paratypes (29), same data as holotype.

Paratypes: Specimens will be deposited in the British Museum (Natural History) London; California Academy of Sciences, San Francisco; Canadian National Collection, Ottawa; Muséum National d'Histoire Naturelle, Paris; Institut royal de Sciences Naturelles de Belgique; Stovall Museum of Science and History, Norman, Oklahoma; Zoologische Sammlung Bayerischen Staates, München; and Dr. Satô's personal collection.

*Etymology.*—This species is named for my friend Dr. Masataka Satô in honor of his numerous contributions to our knowledge of Asiatic water beetles.

*Habitat.*—The type-series was collected from leaf packs among rocks in a partially shaded stream.

*Comparative notes.*—*Dryopomorphus satoi*, n. sp., resembles *D. bishopi* and keys to that species in Hinton's (1971) key to the species. However, *D. satoi* may be distinguished from *D. bishopi* as tabulated below.

<i>Dryopomorphus satoi</i>	<i>Dryopomorphus bishopi</i>
1. Pronotum with fine and coarse punctures.	Pronotum uniformly finely, densely punctate.
2. Hypomeron with anterior cavity for reception of antenna very deep; plane of floor of cavity at an angle of about 80° to plane of posterior surface of hypomeron.	Hypomeron with anterior cavity for reception of antenna moderately deep; plane of floor of cavity at an angle of about 20° to plane of posterior surface of hypomeron.
3. Intervals between rows of coarse elytral punctures distinctly, finely, and densely punctate.	Intervals between rows of moderately coarse elytral punctures microalutaceous and with very few, indistinct, fine punctures.
4. Surface of first abdominal sternum between carinae densely, moderately coarsely punctate.	Surface of first abdominal sternum between carinae very sparsely, moderately coarsely punctate.
5. Scutellum about equally rounded basally and apically; surface finely, densely punctate.	Scutellum wider basally, angulate apically; surface not punctate.

The following key, modified from Hinton (1971), will serve to distinguish the four species presently known in the genus *Dryopomorphus*.

Key to the Species of *Dryopomorphus*

- 1. Eyes flattened, scarcely convex. Hypomeron with anterior cavity for reception of antenna only moderately concave and without transverse carina separating cavity from posterior part of hypomeron. Sublateral pronotal sulci distinctly longer than scutellum. Length, 4.9 mm. Japan . . . . . *extraneus* Hinton
- Eyes strongly convex. Hypomeron with anterior cavity for reception of antenna deep and separated from posterior part of hypomeron by distinct transverse ridge . . . . . 2
- 2. Clypeus, near anterior margin, with row of long, conspicuous setae that are bent over labrum. Sublateral pronotal sulci present on basal two-fifths, nearly twice as long as scutellum. Length 2.6 mm. Japan . . . . . *nakanei* Nomura
- Clypeus, near anterior margin, without conspicuous transverse row of long setae. Sublateral pronotal sulci present on basal fourth, about as long as scutellum . . . . . 3
- 3. Pronotum with fine and coarse punctures. Hypomeron with anterior cavity for reception of antenna very deep; plane of floor of cavity at angle of about 80° to plane of posterior surface of hypomeron. Intervals between rows of coarse elytral punctures distinctly finely, densely punctate. Length, 4.0 mm. Malaysia . . . . . *satoi*, new species
- Pronotum uniformly finely, densely punctate. Hypomeron with anterior cavity for reception of antenna moderately deep; plane of floor of cavity

at angle of about 20° to plane of posterior surface of hypomeron. Intervals between rows of moderately coarse punctures microalutaceous and with very few, indistinct, fine punctures. Length, 3.4 mm. Malaysia .....  
 ..... *bishopi* Hinton

#### Acknowledgments

I thank the following people who contributed to this article: Warren E. Steiner and Gary F. Hevel, for collecting this new species and other interesting aquatic beetles for me in Borneo; Christine von Hayek of the British Museum (Natural History), for making the type-series of *Dryopomorphus bishopi* Hinton available, which allowed me to recognize *D. satoi* as new and distinct; Young T. Sohn, entomological illustrator, for the line drawings; Robin A. Faitoute, museum technician, and Susann Braden, scanning electron microscopist, for the micrographs; and my wife, Phyllis M. Spangler, for typing the manuscript.

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